SUPERFUND PROGRAM PROPOSED PLAN

Crater Resources Inc./Keystone Coke Co./Alan Wood Steel Co. Site

Upper Merion Township
Montgomery County, Pennsylvania June 2000

EPA Announces Proposed Plan

The United States Environmental Protection Agency Region III (EPA) is issuing this Proposed Remedial Action Plan (Proposed Plan) to identify its preferred alternative to address contamination in groundwater, soils, and sediment at the Crater Resources Inc./ Keystone Coke Co./ Alan Wood Steel Co. Superfund Site (referred to as "Crater Resources" or "Site" in this Proposed Plan) located in Upper Merion Township, Montgomery County, Pennsylvania.

Documents supporting EPA's proposed remedy are contained in the Administrative Record for the Site. The Administrative Record includes the Remedial Investigation Report (RI), the Human Health Risk Assessment (HHRA), the Draft Feasibility Study Report (FS), and the EPA Addendum to the Draft FS Report (Addendum). The Administrative Record is at the following locations:

Upper Merion Township Library
175 W. Valley Forge Road
King of Prussia, PA 19406
Phone: (610) 265-2600

Administrative Record Center
U.S. EPA - Region III
1650 Arch Street
Philadelphia, PA 19103
Phone: (215) 814-3157

EPA's Preferred Alternative includes removal of all affected soils and sediments in Quarry 3, construction of a multi-layer cap to prevent infiltration of surface water into the contaminated soils of Quarries 1, 2, and 4 and other affected soil areas, monitored natural attenuation of the groundwater, and further investigation of the former waste ammonia liquor pipeline that was located between the Alan Wood Steel facility and the Crater Resources Site.

EPA and the Pennsylvania Department of Environmental Protection (PADEP) encourage the public to review and comment on EPA's preferred alternative, the Proposed Plan, and other supporting documents in the Administrative Record file. The public comment period begins on June 16, 2000 and closes on July 17, 2000. On June 27, 2000 at 7:00 p.m., EPA will hold a public meeting to discuss the Proposed Plan at the Upper Merion Township Building, 175 W.

Valley Forge Road, King of Prussia, PA 19406. Written comments, postmarked no later than July 17, 2000, should be sent to either of the to individuals below:

Andrea Lord (until June 30, 2000)
Remedial Project Manager
U.S. Environmental Protection Agency
1650 Arch Street - 3HS21
Philadelphia, PA 19103
Phone: (215) 814-5053

Joseph McDowell (after June 30, 2000)
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Interested persons are encouraged to submit their comments on the Proposed Plan and the other documents in the Administrative Record to EPA during the public comment period. Although EPA has selected a preferred alternative, no final decision has been made. EPA may modify the preferred alternative, select another response action, or develop another alternative if public comment or new information presented warrants such an action. EPA, in consultation with PADEP, will make its final selection of a remedy for the cleanup of the contamination at the Site in a Record of Decision (ROD).

This Proposed Plan fulfills the public notification requirements of Sections 113(k)(2)(B), 117(a), and 121(f)(1)(G) of the Comprehensive Environmental Response, Compensation, and Liability Act of 1980, as amended (CERCLA) 42 U.S.C. §§ 9613(k)(2)(B), 9617(a), and 9621(f)(1)(G) (also known as "Superfund") and the general requirements of the National Oil and Hazardous Substances Contingency Plan (NCP) Section 300.430(f)(2).

SCOPE AND ROLE OF RESPONSE ACTIONS

The Site covers 50 acres of partially developed land located approximately one mile south of the King of Prussia section of Upper Merion Township, Montgomery County, Pennsylvania (Figure 1). Portions of the Site are currently being developed by private entities. The Site consists of several subdivided parcels, now owned individually by Crater Resources, Inc., Each Parcel As Is, Inc., Out Parcel, Inc., RT Option, Inc., Liberty Property Trust Limited Partnership, and the Gulph Mills Golf Club (Golf Course). Four former quarries (Quarries 1, 2, 3, and 4) are located on the Site and cover approximately 14 acres. In addition, two small areas, known as Areas 5 and 6 are on the Site. Portions of the former pipeline which carried the waste ammonia liquor (WAL) from the former Alan Wood Steel facility are also in existence. Contamination has been found in the soil, groundwater, and sediment in and beneath Quarries 1, 2, 3, and 4 and Area 6. In addition, contamination has been found in the soils along the route of the former WAL pipeline.

The primary objective of the proposed remedy described in this Proposed Plan is to reduce or eliminate the potential for human or ecological exposure to contaminated soil, sediment, and groundwater at the Site. EPA believes the preferred cleanup alternative outlined in this Proposed Plan will comprehensively address any threat posed by the release of hazardous substances at or from the Site.

SITE BACKGROUND AND HISTORY

From 1918 until 1977, the Alan Wood Steel Company (Alan Wood) and its successors operated a coke and coke byproduct manufacturing facility in nearby Swedeland, Pennsylvania. The facility was located on the west side of the Schuylkill River, approximately one mile northeast of the Site. After Alan Wood declared bankruptcy in 1977, the facility and property were first leased and subsequently sold to the Keystone Coke Company (Keystone Coke). Keystone Coke produced and sold coke at the facility from 1978 until the spring of 1981, when all operations at the facility ceased.

The coking process typically generated coal gas, light oils, tars containing phenolic compounds, naphthalene (resulting from the destructive distillation of coal), ammonia, and wastewater. WAL was pumped via pipeline from the Alan Wood facility to Quarries 1, 2, and 3, and remnants of the pipeline are still visible near the western edge of Quarry 3. The RI found no evidence that Quarry 4 was used directly for WAL disposal, but it may have received impacted water as a result of overflows from Quarry 3 and releases from the WAL pipeline.

On May 16, 1979, EPA conducted a Groundwater Monitoring Survey which involved sampling of Quarry 3 and the surrounding area and included an investigation of possible sources of contamination threatening the Upper Merion Reservoir, a public drinking water source located about one mile to the northwest of the Site and operated by the Philadelphia Suburban Water Company. While conducting sampling at the Site, EPA found phenolic compounds, chlorides, naphthalene, and other organic contaminants in Quarry 3. EPA conducted additional sampling at the Site on May 25, 1979. Subsequently, EPA reported finding trans-1,2-dichloroethylene (DCE) in both the Upper Merion Reservoir and Quarry 3.

On April 8, 1983, EPA conducted a Preliminary Assessment (PA) of the Site, followed by a Site Inspection (SI) on May 9, 1983 during which samples were obtained from Quarry 3 and from three of the monitoring wells that had been installed in 1982 by PADEP in the vicinity of Quarry 3. The PA and SI revealed that hazardous substances were present in Quarry 3 including benzene, toluene, naphthalene, cyanide, zinc, arsenic, lead, phenolic compounds and polynuclear aromatic hydrocarbons (PAHs). Analysis of groundwater in the vicinity of the Site, taken from the monitoring wells, showed the presence of benzene and metals including arsenic, cyanide, lead, mercury, zinc, beryllium, nickel, cadmium, and selenium.

In June 1990, EPA took additional samples at the Site. Samples were collected from waste and soil in Quarry 3, ponded water near the quarry, borings of fill material taken from an area believed to be Quarry 1, offsite monitoring and private wells, and the Upper Merion Reservoir. Waste in Quarry 3 contained elevated levels of various contaminants including cyanide, arsenic, benzene, lead, zinc, and PAHs.

The Site was proposed for listing on the National Oil and Hazardous Substances Pollution Contingency Plan National Priorities List (NPL) of uncontrolled hazardous substances releases pursuant to CERCLA Section 105, 42 U.S.C. § 9605, in February 1992. The Site was listed on the NPL on October 14, 1992.

On September 17, 1994, Beazer East, Inc., Keystone Coke Company, Inc., and Vesper Corporation (herein referred to as the "Crater Resources Participating Parties Group" or "Crater PRP Group") entered into an Administrative Order on Consent (AOC) under CERCLA Sections 104 and 122, 42 U.S.C. §§ 9604 and 9622. Under the AOC, the Crater PRP Group agreed to perform a Remedial Investigation/ Feasibility Study (RI/FS) at the Site to determine the nature and extent of the contamination at or from the Site, and to evaluate alternatives for remedial action to prevent, mitigate or otherwise respond to or remedy the release or threatened release of hazardous substances, pollutants, or contaminants at or from the Site.

The RI field work was completed in January 1999 and the RI Report was approved by EPA on June 23, 1999. After completion of the RI, the Crater PRP Group commenced the FS to evaluate various remedial alternatives to address the nature and extent of contamination identified in the RI.

In December 1999, EPA completed a Human Health Risk Assessment, which is documented in the Final Baseline Risk Assessment Report, to evaluate the human health risks that could result if no remedial action were taken at the Site. The Final Baseline Risk Assessment Report and RI Report are available for review in the Administrative Record for the Site. The human health risks associated with the Site are discussed in the "Summary of Site Risks" Section of this Proposed Plan.

On February 29, 2000, a draft FS report was submitted to EPA by the Crater PRP Group. On April 20, 2000, pursuant to Section IX.A.(3) (Submissions Requiring Agency Approval) of the AOC, EPA notified the Crater PRP Group of its intention to modify and subsequently approve the Draft FS Report. EPA has reviewed the Draft FS report and has completed an Addendum to the FS Report which is available for review in the Administrative Record for the Site.

A brief description of Quarries 1, 2, 3, and 4, Areas 5 and 6, and the WAL pipeline follows. The locations of the quarries and Areas 5 and 6 are shown on Figure 2.

Quarry 1

Quarry 1 is approximately two acres in area. From the 1920s through the 1960s, the Alan Wood Companies used Quarry 1 for waste disposal when it was necessary to bypass Quarry 3. WAL was discharged to the quarry through a pipeline that lead from the coking facility to the Site. The volume of waste disposal is not known. Quarry 1 has since been filled with general fill and construction and demolition debris.

Quarry 2

Quarry 2 is approximately 0.7 acres in area. The Alan Wood Companies also used Quarry 2 for intermittent solid waste disposal from the 1920s through the 1960s. As was the case with Quarry 1, the discharge of WAL to Quarry 2 occurred when Quarry 3 was periodically bypassed. Quarry 2 has since been filled with construction and demolition debris and general fill.

Quarry 3

Quarry 3 is the only open quarry remaining at the Site and covers an area of approximately eight acres, reaching a depth of 65 feet at its western end. Three ponds are located within the quarry (Ponds 1, 2, and 3). Pond 1 is 90 feet by 200 feet and varies in depth from 3 to 12 feet. Pond 2 is 60 feet by 100 feet and ranges in depth from 3 to 7 feet. Pond 3 is 100 feet by 200 feet and ranges from 8 to 15 feet in depth. Remnants of a former dam are present at the eastern end of the quarry. The dam contains an overflow spillway on its northern end. The dam was originally constructed to contain the wastewater that was discharged to the quarry. The Alan Wood Companies discharged WAL directly to Quarry 3 through a pipeline which extended from the facility to the Site, and entered Quarry 3 near its northwestern end.

Quarry 4

The RI found no evidence that Quarry 4 was used directly for WAL disposal, but it may have received impacted water as a result of overflows from Quarry 3 and releases from the WAL pipeline. Quarry 4 has been filled with construction debris and general fill. A portion of the quarry is now covered by a storm water detention basin and part of a building.

Area 5

Area 5 is a large mound located approximately 100 feet southeast of Quarry 4. The mound consists of mainly natural fill material composed of clay, silt, and schist saprolite. A soil boring taken of Area 5 did not detect the presence of any waste materials. Based on the sampling results, it is not likely that Area 5 will require remediation.

Area 6

Area 6 is a small depression located approximately 200 feet northeast of Quarry 4. Past reports have indicated the presence of a strong phenolic odor and a lens of tarry material in the subsurface. A soil sample taken from the area showed constituents similar to those contained in WAL. All soil and materials in Area 6, determined to be geotechnically unstable through an investigation conducted by the current property owner, were recently removed by a private contractor so the property could be marketed for development.

WAL Pipeline

As mentioned previously, WAL was discharged directly to Quarries 1, 2, and 3. WAL was conveyed to the quarries from the Alan Wood plant through a 4-inch diameter steel pipeline. EPA originally believed that the pipeline existed solely as an aboveground pipeline; portions of the pipeline were dismantled in 1989. However, during the RI, portions of an underground pipeline were discovered along the pipeline route. The route of the pipeline is depicted on Figure 1. The RI Report indicates that the pipeline experienced occasional breaks and leaks along the route from the Alan Wood Plant to the quarries.

In May 1997, during the RI, an underground section of the WAL pipeline was discovered approximately one mile from the Site, where it crossed beneath Flint Hill Road, before re-emerging as an aboveground pipeline. This section of pipeline was discovered during excavation

of a stormwater culvert beneath Flint Hill Road. The pipe and adjacent impacted soil were removed and properly disposed of offsite.

In January 1998, Liberty Property Trust (Liberty) discovered a second section of underground pipeline on a parcel of land they purchased on and adjacent to the Crater Resources Site. Liberty removed all sections of the pipeline and associated contaminated soil on their property, completing the work in April 2000.

Additional sections of pipeline have since been removed by the Crater PRP Group. An underground pipeline was found on property owned by Keystone between Flint Hill Road and Route 23, and was removed by the Crater PRP Group and their consultants in December 1999.

NATURE AND EXTENT OF CONTAMINATION

Quarry 1

During the Remedial Investigation, seven subsurface soil and five surface soil samples were taken in Quarry 1. Sludge-like material was encountered in the northeastern portion of the quarry at a depth of 19 feet, and a zone of stained silty clay was encountered at a depth of 71 feet in the central portion of the quarry. These materials contained elevated concentrations of volatile organic compounds (VOCs), cyanide, and PAHs, with naphthalene levels reaching 2,900,000 milligrams per kilogram (mg/kg) and selenium reaching levels of 33.3 mg/kg. Some elevated levels of metals including aluminum (up to 30,500 mg/kg) and manganese (up to 2480 mg/kg) were noted at depths between six and eight feet.

Quarry 2

Eleven soil samples were taken in Quarry 2. A layer of stained soil was observed starting eight feet below the surface and extending to depths of 23 feet. Several PAHs were detected in all of the soil samples collected from Quarry 2. Minor concentrations of cyanide were found in the stained material, and in the sand at a depth of 50 to 52 feet. Several elevated levels of metals were present, including iron (up to 143,000 mg/kg) and manganese (up to 1530 mg/kg).

Quarry 3

Surface and Subsurface Soils

Both the surface and subsurface soils within Quarry 3 showed elevated levels of phenols and several PAHs. The contaminants include the following: benzo(a)anthracene at a range of 0.28 to 610 mg/kg; benzo(b)fluoranthene ranging from 0.7 to 690 mg/kg; benzo(a)pyrene ranging from 0.54 to 470 mg/kg; dibenz(a,h)anthracene ranging from 0.15 to 100 mg/kg; 2-methylnaphthalene ranging from 0.655 to 3500 mg/kg; indeno(1,2,3-cd)pyrene ranging from 0.6 to 330 mg/kg; and naphthalene ranging from 4.75 to 270,000 mg/kg. High levels of aluminum (up to 26,700 mg/kg) and iron (up to 62,000 mg/kg) were found in all soil samples taken in the quarry, and mercury (up

to 49 mg/kg), arsenic (up to 660 mg/kg) and manganese (up to 11,400 mg/kg) were present in the subsurface soils.

Sediments

The sediments in the bottom of the three ponds in Quarry 3 are tarry in nature and contain elevated concentrations of several contaminants. These include: benzo(a)anthracene ranging from 14 to 2100 mg/kg; benzo(b)fluoranthene ranging from 30 to 3800 mg/kg; benzo(a)pyrene ranging from 18 to 2500 mg/kg; and naphthalene ranging from 27 to 37,000 mg/kg. Pond 1 sediments are between 10 and 16 feet thick; Pond 2 sediments vary from 0.5 to 5 feet thick; and Pond 3 contains 3 to 7 feet of sediments.

Quarry 4

The soils in Quarry 4 contain concentrations of PAHs, cyanide, and pesticides. Several metals including aluminum (up to 22,600 mg/kg), chromium (up to 331 mg/kg), iron (up to 113,000 mg/kg), maganese (up to 6200 mg/kg), and vanadium (up to 2140 mg/kg) are present in Quarry 4.

Other Surface Soil Samples

SS-1 and SS-2 (Figure 2) were collected in the areas where the pipeline valves were located. These samples contained concentrations of PAHs and metals, indicating that the pipeline leaked in this area. Contaminants included the following: aluminum at 9,690 mg/kg; iron at 51,700 mg/kg; and manganese at 1,940 mg/kg. Sample SS-3 was taken in a swale east of Quarry 3 and contained phenols and PAHs, including 6,600 ug/kg of benzo(a)pyrene. Several metals were also detected in these samples including iron at 64,900 mg/kg and manganese at 517 mg/kg.

Pipeline

Soil samples that were collected adjacent to and beneath a portion of the buried pipeline, which has since been removed by Liberty, indicated the presence of several PAHs and metals. These included aluminum (up to 27,700 mg/kg); chromium (up to 43.9 mg/kg); arsenic (up to 146 mg/kg); benzo(a)pyrene (up to 390 mg/kg); benzo(a)anthracene (up to 430 mg/kg); and benzo(b)fluoranthene (up to 420 mg/kg).

Area 5

One soil sample was taken from Area 5 and indicated low concentrations of PAHs and cyanide in the surface soils, but did not contain any volatile organic compounds (VOCs). Soil at 30 to 32 feet below ground surface contained low concentrations of carbon disulfide at 10 mg/kg, 2-butanone at 24 ug/kg, and bis (2-ethylhexyl) phthalate at 88 ug/kg. Some low levels of metals were detected in the sample, including aluminum at 2,520 mg/kg.

Area 6

A small lens of tarry material was found in a soil boring during a sampling event conducted by Pennoni Associates Inc. in 1993. The tarry material contained elevated VOCs, including benzene at 2100 ug/kg, and several PAHs, including naphthalene at 29,000,000 ug/kg. All soil and materials in Area 6, determined to be geotechnically unstable during an investigation by the current property owner, were recently removed by a private contractor so the property could be marketed for development.

Groundwater

One round of groundwater samples was taken during the Remedial Investigation, between 1996-1998 (see Figure 3, Monitoring Well Locations). The sampling indicated that the groundwater plume extends from Quarry 1, toward the northeast. Groundwater data collected during the Remedial Investigation concluded that groundwater flows primarily to the east/northeast, in the direction of the Schuylkill River.

In general, elevated levels of VOCs, semi-volatile organic compounds (SVOCs), and cyanide in the groundwater were found near the source of the quarries onsite. VOCs detected included acetone up to 420 micrograms per liter (ug/L), benzene up to 250 ug/L, and chloroform up to 3.9 ug/L. SVOCs detected include naphthalene up to 1300 ug/L, dibenzofuran up to 16 ug/L, 2,4-dimethylphenol up to 580 ug/L, 2-methylphenol up to 6300 ug/L, 4-methylphenol up to 24,000 ug/L, and phenol up to 19,000 ug/L. Cyanide was detected at levels up to 1,120 ug/L.

The monitoring wells located directly downgradient of each of the quarries tended to have high concentrations of metals including: arsenic (up to 49.85 ug/L), beryllium (up to 245 ug/L), chromium (up to 205 ug/L), and manganese (up to 33,600 ug/L). The metals concentrations were highest at the northeastern end of the Site.

Low concentrations of Site-related constituents were detected in the monitoring wells that reach the outer edges of the groundwater plume. Some chlorinated VOCs were detected at low concentrations in the golf course well and the pond well. Low concentrations of phthalates were also detected in several of the wells across Renaissance Boulevard owned by Liberty. Chlorinated VOCs were detected in several of the wells sampled on the SmithKline Beecham property located approximately 0.5 miles east of the Site.

Surface Water

Surface water is found in the three ponds in Quarry 3. The surface water contains low levels of cyanide, iron, mercury, and selenium.

SUMMARY OF SITE RISKS

Following the Remedial Investigation, EPA conducted an analysis to evaluate the human health risks that could result if no remedial action were taken at the Site. The purpose of a Risk Assessment is to establish the degree of risk or hazard posed by contaminants at a Site, and to describe the routes by which humans could come into contact with these contaminants. A

separate analysis is conducted for those substances that can cause cancer (carcinogenic) and for those that are non-cancer causing (non-carcinogenic), but still may cause adverse health effects.

The NCP established acceptable levels of carcinogenic risk for Superfund sites ranging from one excess cancer case per 10,000 people exposed, to one excess cancer case per one million people exposed. This translates to a risk range of between one in 10,000 and one in one million additional human cancer cases. Expressed as scientific notation, this risk range is between 1E-04 and 1E-06. Remedial action is warranted at a site when the calculated cancer risk level exceeds 1E-04. However, since EPA's cleanup goal is generally to reduce the risk to 1E-06 or less, EPA also may take action where the risk is within the range between 1E-04 and 1E-06.

The NCP also states that sites should not pose a health threat due to a non-carcinogenic, but otherwise hazardous condition. EPA defines a non-carcinogenic threat by the ratio of the contaminant concentration at the Site that a person may encounter to the established safe concentration. If the ratio, call the Hazard Index (HI), exceeds one (1), there may be concern for the potential non-carcinogenic health effects associated with exposure to the contaminants at the Site. The HI identifies the potential for the most sensitive individuals to be adversely affected by the non-carcinogenic effects of chemicals. As a rule, the greater the value of the HI above 1, the greater the level of concern.

The media of concern evaluated in the Risk Assessment were surface soil, total soil (surface soil and subsurface soil combined), air, surface water, groundwater, and sediments. The risks to Industrial Workers, Construction Workers, Adolescent Trespasser/Visitors, and Residents are summarized in Table 1. The Table is based on risks of the receptor coming in direct contact with, ingesting, or inhaling contaminants from the evaluated media. It should be noted that the risks listed in Table 1 refer to conservative long-term exposure times and toxicity values, and do not represent risks from a one-time encounter with contaminants at the Site. Detailed descriptions of the risk factors and risk scenarios are included in the Final Baseline Risk Assessment in the Administrative Record.

As is shown in Table 1, the greatest maximum hazard index risk is to a child resident potentially using groundwater. The greatest cancer risk is to a resident ingesting contaminated soils from Quarry 3.

The Risk Assessment determined that hazardous substances at the Site may present a potential threat to human health if they are not addressed by a remedial action. EPA has determined that a remedial alternative needs to be selected to reduce the future risks to acceptable levels. Actual or threatened releases of hazardous substances from this Site, if not addressed by a remedial action, present a current or potential threat to public health, welfare, or the environment.

The PRP Group conducted a screening level Ecological Risk Assessment (ERA) during the RI. The purpose the ERA was to provide an estimate of potential risks from Site-related contaminants to ecological receptors at or near the Site. The ERA concluded that the ecological receptors at the Site may be at risk from coming into direct contact with the surface water and sediments in the ponds in Quarry 3, and through eating those lower on the food chain who have also come into contact with contaminated media. However, the ERA also states that the quarry

area does not provide significant habitat for receptors who would thrive in an aquatic setting. The ERA found that the receptors that are most susceptible to risks from Site-related contamination are insects, insect larvae, and amphibians that may be periodically exposed to contaminated sediments and surface water.

SUMMARY OF ALTERNATIVES

The Superfund Law (CERCLA) requires that any remedy selected to address contamination at a hazardous waste site must be protective of public health, welfare, and the environment, cost-effective, in compliance with regulatory and statutory provisions that are applicable or relevant and appropriate requirements (ARARs), and consistent with the NCP to the extent practicable. CERCLA also expresses a preference for permanent solutions, for treating hazardous substances onsite, and for applying alternative or innovative technologies.

The Feasibility Study discusses the full range of alternatives evaluated for the Site and provides supporting information relating to the alternatives in this Proposed Plan. This Proposed Plan discusses a No Action alternative, as required by the NCP at 40 CFR §300.430 (e)(6), and other alternatives that are determined by EPA to be protective of human health and the environment, achieve state and federal regulatory requirements, and best achieve the cleanup goals for the Site. These alternatives are derived from those presented in the Draft Feasibility Study Report and the Addendum to the Draft FS Report, and are presented in the categories of Site-wide Alternatives, Soil/Sediment Alternatives, and Groundwater Alternatives.

The Alternatives presented in the Draft FS Report were developed to meet remedial action objectives, or specific environmental goals established for the affected media at the Site. These objectives are based on achieving preliminary remediation goals (PRGs) established in the Draft FS Report and modified in the Addendum. PRGs may include soil screening levels developed for soil to groundwater pathway scenarios and risk-based concentrations developed from the human health risk assessment. Risk-based PRGs were developed to meet a target excess cancer risk of 1 in 100,000 (expressed in scientific notation as 1E-05) additional human cancer cases or a target hazard index value of 1. The calculations of the PRGs and the PRG tables can be found in Appendix C of the Draft FS Report, with modifications in the Addendum.

SITE-WIDE ALTERNATIVES

Alternative SW-1: No Action

Capital Cost $ 0
Total Present Worth Cost $ 0
Annual Operation & Maintenance (O&M) Cost $ 0

Section 300.430 (e)(6) of the NCP requires the development of a No Action alternative for remedial actions. Under the No Action alternative, no remedial action will be taken to remove, control mitigation from, or minimize exposure to contaminated soils and sediment. The No Action alternative establishes a baseline or reference point against which each of the remedial action alternatives are compared. In the event that the other identified alternatives do not offer

substantial benefits in the reduction of toxicity, mobility, or volume of the constituents of concern, the No Action alternative may be considered a feasible approach.

Under this Alternative, no effort would be made to control the future use of the contaminated area. Existing contaminated soils and sediments would remain in place in all of the affected areas. No capitol costs would be incurred and no ARARs would be considered under this alternative. Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years pursuant to Section 121(c) of CERCLA, 42 U.S.C. §9621 (c).

Alternative SW-2: Institutional Controls

Capital Cost	$ 145,000
Total Present Worth Cost	$ 230,000
Annual O&M Cost	$ 2,000

Institutional controls would be implemented to restrict onsite soil, sediment, surface water and groundwater use and/or disturbance at the Site, except as required for implementation of the remedy, in order to reduce the potential for human exposure to contamination (i.e. easements, restrictions, covenants, title notices, etc.). With respect to groundwater, such controls may consist of limitations on well drilling, prohibitions, or limitations on certain uses of groundwater. With respect to soils and sediments, institutional controls may consist of restrictions on excavation or removal of contaminated soils from the affected areas and prohibitions on any activity that may disturb the soils and/or sediments. Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years.

Alternative SW-3: WAL Pipeline Investigation

Total Present Worth Cost: $148,000

This alternative calls for further investigation of the WAL pipeline that lead from the Alan Wood Steel facility to the Site. During the Remedial Investigation, portions of an underground pipeline were found along the former pipeline route. Some sections have been removed by the Crater PRP Group and other private parties. However, the entire route of the former WAL pipeline has never been fully investigated. This alternative would require a full investigation of the former pipeline route, with soil samples to determine the existence of any contamination along the route. The investigation would be conducted during the design phase of the remedy, and if required, remediation of portions of or the entire pipeline route would be conducted as part of the cleanup at the Site, and all applicable or relevant and appropriate requirements regarding removal of the pipeline and associated soils would apply.

SOIL/SEDIMENT ALTERNATIVES

Alternative S-3: Soil Cover

Capital Cost	$ 5,295,000

Total Present Worth Cost	$ 5,407,000
Annual O&M Cost	$ 9,900

This alternative would cover Quarries 1, 2, 3, and 4, and all other affected soil areas with a layer of clean fill and soil. The Quarry 3 ponds would be dewatered, and the water would be transported to an offsite disposal facility in accordance with 40 CFR §300.440. The dewatered ponds would be filled with clean soil and regraded for proper stormwater drainage. Quarries 1, 2, and 4 and other affected soil areas would be filled and regraded as needed. Institutional controls to restrict soil disturbance and excavation activities, except as required by implementation of the remedy, would be required for these areas.

This alternative would prevent direct contact with all affected surface soil/sediment and enable drainage across affected areas to channel water away from the contamination. Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years.

Alternative S-4: Low-Permeability Cap

Capital Cost	$ 7,353,000
Total Present Worth Cost	$ 7,501,000
Annual O&M Cost	$ 11,900

This alternative calls for a low-permeability or multi-media cap on all quarries and affected soil/sediment areas to prevent unacceptable leaching of contaminants from the soils and sediment into the groundwater. In addition, it would prevent direct contact to human health and environmental receptors.

A multi-media cap contains a series of layers to prevent the surface water from reaching the contamination below the surface. A multi-media cap consists of a series of low-permeability clays, geotextile liners, sand drainage layers, and soil or other appropriate covers. The Draft FS Report calls for a multi-media cap on Quarry 3 and asphalt capping on the remaining areas or those areas where development of the office park is anticipated. However, due to the uncertainty of future actions at the Site, EPA has chosen multi-media capping for all affected areas. Asphalt could be added into the design of the cap in the future, once plans for the area are confirmed.

Ponds 1, 2, and 3 in Quarry 3 would be dewatered and the water would be transported to an offsite disposal facility in accordance with 40 CFR §300.440. All areas throughout the Site requiring a cap would be graded to appropriate elevations prior to cap installation. Institutional controls (i.e., use restrictions, title notices, and proprietary controls) would be implemented to ensure that the cap integrity is maintained. Construction or use of the property that in any way is inconsistent with the proposed remedy and the integrity of the cap would be prohibited. In addition, long-term maintenance of the capped areas would be conducted to ensure continued effectiveness. Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years.

Alternative S4-A: Quarry 3 Sediment Removal/Low-Permeability Capping

Capital Cost	$ 9,064,000
Total Present Worth Cost	$ 9,211,000
Annual O&M Cost	$ 11,900

This alternative calls for removal of the contaminated sediments from the ponds in Quarry 3, and low-permeability capping of all other affected areas of the Site. This alternative would prevent direct contact with all affected soils and sediments, and help to prevent leaching of contaminants from the soils and sediment to the groundwater.

Ponds 1, 2, and 3 would be dewatered and the water would be transported to an offsite disposal facility in accordance with 40 CFR §300.440. The sediments would be excavated from the bottom of the ponds down to a level that meets risk-based concentrations. The sediments would be dewatered, sampled to determine appropriate disposal, and disposed of offsite or recycled. The ponds would then be backfilled with clean fill. The Quarry 3 plateau areas and surface soils would be regraded and capped with a low-permeability cap as described in Alternative S-4, as would Quarries 1, 2, and 4 and all other remaining affected areas.

Institutional controls (i.e., use restrictions, title notices, and proprietary controls) would be implemented to ensure that the cap integrity is maintained. Construction or use of the property that in any way is inconsistent with the proposed remedy and the integrity of the cap would be prohibited. In addition, long-term maintenance of the capped areas would be conducted to ensure continued effectiveness. Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years.

Alternative S-4B: Quarry 3 Sediment Stabilization/Low-Permeability Capping

Capital Cost	$ 10,342,000
Total Present Worth Cost	$ 10,489,000
Annual O&M Cost	$ 11,900

This alternative calls for stabilization of the Quarry 3 pond sediments and low-permeability capping of all affected soil areas. Sediment stabilization and low-permeability capping would prevent direct contact with affected soils and sediments, and help to prevent leaching of contaminants into the groundwater.

Ponds 1, 2, and 3 in Quarry 3 would be dewatered and the water would be transported to an offsite disposal facility in accordance with 40 CFR §300.440. A stabilization agent would then be added to the sediments in the ponds that contain contaminant levels above risk-based concentrations. Stabilizing the sediments would prevent leaching of the contaminants from the sediments to the groundwater. Prior to remediation being preformed, a treatability study may be required to verify the stabilization mix. The Quarry 3 plateau area and surface soils would remain in place, and be capped with a low-permeability cap as described in Alternative S-4, as would Quarries 1, 2, and 4 and all other remaining affected areas.

Institutional controls (i.e., use restrictions, title notices, and proprietary controls) would be implemented to ensure that the cap integrity is maintained. Construction or use of the property that in any way is inconsistent with the proposed remedy and the integrity of the cap would be prohibited. In addition, long-term maintenance of the capped areas would be conducted to ensure continued effectiveness. Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years.

Alternative S-5: Quarry 3 Removal/Low-Permeability Capping

Capital Cost	$ 11,806,000
Total Present Worth Cost	$ 11,954,000
Annual O&M Cost	$ 11,900

This alternative calls for removal of contaminated soils and sediments in Quarry 3 and low-permeability capping of Quarries 1, 2, and 4 and all other affected areas to prevent direct contact with contamination and unacceptable leaching of contaminants into the groundwater beneath the Site.

As in the previous alternatives, Ponds 1, 2, and 3 would be dewatered and the water would be transported to an offsite disposal facility in accordance with 40 CFR §300.440. The sediments at the bottom of the ponds would be excavated down to the bedrock layer or to the level where contaminant concentrations in the sediments are below human health or ecological risk-based concentrations, dewatered, and taken offsite for proper disposal or recycling. The Quarry 3 plateau area would be excavated down to the bedrock layer or to the level where the contaminant concentrations in the soils are below human health or ecological risk-based concentrations, and the soil would be taken offsite for proper disposal or recycling. All remaining soil areas in Quarry 3 with contaminant levels above human health or ecological risk-based concentrations would be removed and taken offsite for proper disposal or recycling. The excavated areas would then be filled with clean soil and graded for proper drainage.

Quarries 1, 2, and 4 and all other remaining affected areas would be graded and capped as described in Alternative S-4 above. Institutional controls (i.e., use restrictions, title notices, and proprietary controls) would be implemented to ensure that the cap integrity is maintained. Construction or use of the property that in any way is inconsistent with the proposed remedy and the integrity of the cap would be prohibited. In addition, long-term maintenance of the caps would be conducted to ensure continued effectiveness. Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years.

Alternative S-6 : Complete Removal

Capital Cost	$ 69,103,000
Total Present Worth Cost	$ 69,103,000
Annual O&M Cost	$ 0

This alternative calls for removal of all affected soils and sediments, in order to prevent further leaching of contaminants from soil to groundwater, and to remove any direct contact risk.

Ponds 1, 2, and 3 would be dewatered and taken offsite for proper disposal in accordance with 40 CFR §300.440. The sediments will be taken offsite for proper disposal or recycling as described in the above alternatives. Soils in Quarries 1, 2, 3, and 4 and throughout the Site that have contamination levels above the risk-based concentrations or preliminary remediation goals described in the Draft FS Report would be excavated and taken offsite for disposal or recycling. All excavated areas would then be backfilled with clean fill and graded for proper stormwater drainage.

Although all contaminated soils would be removed, contaminated groundwater would remain beneath the Site. Therefore, a review of Site conditions would be required no less than every five years.

Alternative S-7: Stabilization

Capital Cost	$ 79,873,000
Total Present Worth Cost	$ 104,030,000
Annual O&M Cost	$ 9,900

This alternative would treat the contaminated soils and sediment through in situ (below ground) methods. In situ treatment would immobilize the contaminants in the soils and sediments and prevent them from migrating into the groundwater. Soils in Quarries 1, 2, 3, and 4 and throughout the Site that have levels of contaminants above risk-based concentrations or preliminary remediation goals, would be stabilized and then topped with a soil cover to prevent direct contact with the stabilized soils. Prior to the in situ stabilization process, the ponds in Quarry 3 would be dewatered and the water would be transported to an offsite disposal facility in accordance with 40 CFR §300.440. A treatability study to determine the stabilization mix appropriate for the Site soils and sediments may be required prior to remediation.

Institutional controls to restrict disturbance of the stabilized areas (i.e., prohibitions on excavation and drilling, etc.) would be required. Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years.

GROUNDWATER ALTERNATIVES

Alternative GW-3: Monitored Natural Attenuation

Capital Cost	$ 50,000
Total Present Worth Cost	$ 600,000
Annual O&M Cost	$ 26,600

This alternative provides for natural attenuation and groundwater monitoring in accordance with the ten criteria contained in EPA's guidance titled "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites" dated April 21, 1999. Groundwater monitoring would occur at approximately 15 locations, both onsite and offsite, in order to sample for selected Site-related SVOCs, metals, cyanide, and VOCs that presently exceed preliminary remediation goals. This monitoring would provide a basis to determine whether or not natural attenuation is taking place.

In accordance with the Monitored Natural Attenuation Guidance, EPA has chosen a time limit of 15 years of monitoring to determine whether or not the groundwater is naturally attenuating. If, during the15 year time period, it is evident that natural attenuation is not occurring, EPA will default to the contingent groundwater remedy, which is described in the "Preferred Remedial Alternative" Section of this Proposed Plan.

Institutional controls would be required to prevent exposure to groundwater contamination (i.e., prohibitions on well drilling, well installation, etc.), except as required by the remedy. Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years.

Alternative GW-4: Downgradient Groundwater Recovery

Capital Cost	$ 1,607,000
Total Present Worth Cost	$ 3,380,000
Annual O&M Cost	$ 64,800

This alternative would require an increase in the pumping rate of the pond well located southeast of the Site. The pump in this well is currently used only when needed to replenish water in the pond adjacent on the Gulph Mills Golf Course. This alternative suggests pumping the water in the well at a constant rate, and by doing so, containing the groundwater plume to keep it from migrating further offsite. The excess water pumped from the well would be treated to meet treatment goals to be specified in the ROD. The treatment method specified in the Draft FS Report is filtration to remove suspended solids, however the exact treatment method to be used would be determined in the ROD. Examples of other possible treatment methods include air stripping, filtration, granular activated carbon adsorption, and chemical oxidation. The treatment system would likely be located onsite with discharge of the treated water to the Schuylkill River or Matsunk Creek.

Groundwater monitoring would be necessary to be sure the plume is being contained. Institutional controls would be required to prevent unauthorized exposure to groundwater contamination (i.e., prohibitions on well drilling, well installation, etc.). Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years.

Alternative GW-5: Groundwater Recovery, Treatment, and Discharge

Capital Cost	$ 2,184,000

Total Present Worth Cost	$ 7,270,000
Annual O&M Cost	$ 221,700

This alternative calls for ground water recovery and treatment from the center of the groundwater plume at the Site. The purpose is to extract and treat the most highly contaminated groundwater from beneath the Site. The recovery system would pump the water near the downgradient edges of Quarries 2 and 3 using a line of recovery wells spread across the width of the plume. The groundwater would then be pumped to an onsite treatment facility to remove contaminants to specified treatment levels and the treated water would be discharged to the Schuylkill River or Matsunk Creek. Groundwater treatment options include, among others, chemical oxidation, air stripping, and granular activated carbon adsorption.

Groundwater monitoring would be necessary to be sure the contamination levels within the plume are decreasing. Institutional controls would be required to prevent exposure to the contaminated groundwater plume (i.e., restrictions on drilling of wells, etc.) Institutional controls would also be required to prevent disturbance of the recovery wells and onsite treatment facility. Since contaminated media would be left onsite, a review of Site conditions would be required no less than every five years.

NINE EVALUATION CRITERIA

Each of the remedial alternatives summarized in this Proposed Plan has been evaluated with respect to the nine (9) evaluation criteria set forth in the NCP, 40 C.F.R. Section 300.430(e)(9). These nine criteria can be categorized into three groups: threshold criteria, primary balancing criteria, and modifying criteria. A description of the evaluation criteria is presented below:

Threshold Criteria:

1. *Overall Protection of Human Health and the Environment* addresses whether a remedy provides adequate protection, both short-term and long-term, and describes how risks are eliminated, reduced, or controlled.
2. *Compliance with Applicable or Relevant and Appropriate Requirements (ARARs)* addresses whether a remedy will meet all of the applicable, or relevant and appropriate requirements of federal environmental laws, as well as state environmental or facility siting laws.

Primary Balancing Criteria:

3. *Long-term Effectiveness and Permanence* refers to the ability of a remedy to maintain reliable protection of human health and the environment over time once cleanup goals are achieved. In addition, it examines the degree of certainty that the alternative will prove successful.
4. *Reduction of Toxicity, Mobility, or Volume through Treatment* addresses the degree to which an alternative employs recycling or treatment that reduces toxicity, mobility, or volume of contaminants.

5. *Short-term Effectiveness* addresses the period of time needed to achieve protection and any adverse impacts on human health and environment that may be posed during the construction and implementation of the alternative.
6. *Implementability* addresses the technical and administrative feasibility of a remedy, including the availability of materials and services needed to implement a particular alternative.
7. *Cost* refers to an evaluation of the types of costs that will be incurred with respect to a particular alternative. The following are estimated: capital costs including direct and indirect costs, annual operation and maintenance costs, and net present value of capital and O&M costs.

Modifying Criteria:

8. *State Acceptance* indicates whether, based on its review of backup documents and the Proposed Plan, the State concurs with, opposes, or has no comment on the preferred alternative.
9. *Community Acceptance* will be assessed in the Record of Decision following a review of public comments received on the Proposed Plan and supporting documents included in the Administrative Record.

COMPARATIVE EVALUATION OF ALTERNATIVES

1. Overall Protection of Human Health and the Environment

A primary requirement of the NCP is that the selected remedial alternative be protective of human health and the environment. A remedy is protective if it reduces current and potential risks to acceptable levels under the established risk range posed by each exposure pathway at the Site.

Alternative SW-1 would provide no basis for monitoring existing conditions at the Site and therefore would provide no assurances that affected media would remain undisturbed, and that risks to human health would not change. Alternative SW-2 would provide institutional controls to prevent direct contact with contaminated media, however no remediation would take place. SW-3 provides for investigation of the former WAL pipeline, and could provide for protection if portions of the pipeline and associated contaminated soils are found and removed. Alternatives S-4, S-4A, S-4B, S-5 and S-7 all provide protectiveness through capping by preventing direct contact with affected materials and reducing further leaching of contaminants in soil to the groundwater. The soil cover in S-3 would prevent direct contact with affected media, but would still allow leaching of soil contamination to groundwater since the permeability of a soil cover is relatively high. Alternatives S-4A, S-5, and S-6 all provide a high level of protectiveness since portions of the contaminant source areas in the soils would be removed. Ongoing maintenance of the capping alternatives would be required to ensure long-term protectiveness.

For groundwater, Alternative GW-5 provides for the most contaminant mass removal since the extraction wells would be located in the center of the groundwater plume. Alternative GW-4 would provide a slower mass removal of contaminants, since only one extraction well would be

located at the downgradient side of the plume. Alternative GW-3 is protective, since the surrounding community obtains drinking water from municipal water lines, and therefore no current ingestion risk from the groundwater exists. In addition, the groundwater is 70 feet below the ground surface in most parts of the Site, so there are no significant risks for direct contact with the contaminated groundwater. No adverse environmental impacts would occur from implementation of any of the groundwater alternatives, since any surface discharge would be monitored to meet National Pollutant Discharge Elimination System (NPDES) requirements.

2. Compliance with Applicable or Relevant and Appropriate Requirements (ARARS)[1]

Any cleanup alternative considered by EPA must comply with all applicable or relevant and appropriate federal and state environmental requirements. Applicable requirements are those substantive environmental standards, requirements, criteria, or limitations promulgated under federal or state law that are legally applicable to the remedial action to be implemented at the Site. Relevant and appropriate requirements, while not being directly applicable, address problems or situations sufficiently similar to those encountered at the Site. ARARs may relate to the substances addressed by the remedial action (chemical specific), to the location of the site (location specific), or to the manner in which the remedial action is implemented (action specific).

Major ARARs that may apply to the groundwater remedies listed in this Proposed Plan include: Federal Maximum Contaminant Levels (MCLs) and/or Maximum Contaminant Level Goals (MCLGs); National Pollutant Discharge Elimination System (NPDES) program requirements; 40 CFR 131 (compliance with established water quality standards); and Section 402 of the Clean Water Act. Earth moving activities in the soil alternatives would need to comply with 25 PA Code Chapter 102, requiring an erosion and sediment control plan, to be submitted to the Montgomery County Soil Conservation District for review and comment. The multi-layer capping alternatives would need to meet all PADEP regulations for caps. To the extent necessary, soils and sediments excavated from the quarries and ponds would be sampled to determine the appropriate disposal method. A complete review and explanation of all ARARs that apply to the Site will be presented in the ROD.

SW-1, SW-2, and SW-3 would not meet applicable groundwater standards, since no remediation would be performed.

None of the groundwater alternatives, GW-3, GW-4, and GW-5, provide short-term compliance with ARARs when not coupled with a soil alternative, since without a soil alternative, leaching of the contaminants from the soils to the groundwater would not be reduced. Alternatives GW-4 and GW-5 would meet NPDES requirements. Alternative GW-3, would be evaluated and

[1] Under Section 121(d) of CERCLA, 42 U.S.C. § 9621 (d), and EPA guidance, remedial actions at CERCLA sites must attain legally applicable or relevant and appropriate federal and promulgated state environmental standards, requirements, criteria and limitations which are collectively referred to as "ARARs," unless such ARARs are waived under Section 121(d)(4) of CERCLA, 42 U.S.C. § 9621(d)(4).

monitored in accordance with EPA's "Use of Monitored Natural Attenuation at Superfund, RCRA Corrective Action, and Underground Storage Tank Sites" dated April 21,1999.

For soils and sediments, Alternatives S-4A, S-5, and S-6 would meet action-specific ARARs associated with excavation, transport and treatment of soils. Alternatives S-4, S-4A, S-4B, and S-5 would meet the PADEP requirements for cap permeability.

3. Long-Term Effectiveness and Permanence

For the Site-wide Alternatives, SW-1 would leave the Site in its current condition, and no long-term effectiveness would result, since no treatment or restrictions to prevent direct contact with contamination would occur. SW-2 may be effective in the long-term if the institutional controls to restrict access to Site-related contamination are enforced. SW-3 would be effective in determining how much of the WAL pipeline and any associated contamination remains, and would achieve long-term effectiveness and permanence if the any portions of the pipeline and associated contaminated soils are found and removed.

For soils and sediments, Alternatives S-4 through S-7 are expected to be effective since restrictions would be required to prevent exposure to contaminated media. Alternative S-6 would be the most effective and protective in the long-term since complete removal of all affected soils would take place. Alternatives S-5 and S-4A are effective and permanent in the long-term since removal or partial removal of affected soils would take place. Alternatives S-4B and S-7 would prevent leaching of some or all soil contaminants to the groundwater since affected soil would be stabilized. Alternative S-3 has the highest residual risk of the soil/sediment alternatives since only a soil cover is used for waste containment.

For groundwater, GW-3, GW-4, and GW-5 achieve long-term effectiveness and permanence since removal of contaminants from the groundwater would take place. The groundwater alternatives are more effective when coupled with a soil alternative, since the soil alternatives either remove a source area or prevent contaminants from leaching from soil areas into the groundwater.

4. Reduction of Toxicity, Mobility, or Volume through Treatment

Section 121(b) of CERCLA, 42 U.S.C. Section 9621(b), establishes a preference for remedial actions which include treatment that permanently and significantly reduces the toxicity, mobility, or volume of contaminants.

For the Site-wide Alternatives, SW-1 and SW-2, no treatment would be performed, so no reduction of toxicity, mobility, or volume of contaminants would occur. SW-3 would reduce mobility, toxicity, or volume if any portions of the pipeline and associated contaminated soils are found and removed.

For soils and sediments, Alternatives S-6 and S-7 achieve the highest reduction of toxicity, mobility, and/or volume, since all affected soils would be removed or stabilized. Alternatives S-5, S-4A, and S-4B also provide a high level of treatment through partial removal or partial stabilization. Alternatives S-4 and S-3 do not provide for treatment, but will reduce or prevent leaching of soil contaminants to groundwater.

For groundwater, Alternative GW-5 provides for the greatest reduction of mobility, toxicity, and volume since contamination from the center of the groundwater plume would be extracted and treated. Alternative GW-4 also provides for a reduction in mobility, toxicity, and volume. Alternative GW-3 relies on natural attenuation which provides for a reduction in toxicity and volume through natural processes.

5. Short-Term Effectiveness

SW-2 would provide greater short-term effectiveness than SW-1 since the restrictions required for the Site would prevent individuals from coming in direct contact with onsite contamination. SW-3 would be effective in the short-term if investigation of the pipeline yields remaining portions that are subsequently removed to prevent any associated risk. For soils and sediments, Alternatives S-4A, S-5, and S-6 would require an increase in truck traffic to transport the removed soil offsite, however the amount of traffic associated with Alternatives S-4A and S-5 would be much lower than that associated with Alternative S-6. Alternatives S-3, S-4, S-4B, and S-7 would have minimal impact on the surrounding community in terms of truck traffic and other construction activities. All soil/sediment alternatives are equivalent in terms of effectiveness of temporary protective measures during cleanup. It should be noted that complete removal of all materials in the four quarries, as called for in Alternative S-6, may take over four years just for the excavation of the soils and sediments, and would not provide short-term effectiveness.

None of the groundwater alternatives would have an adverse effect on the surrounding community, since only minor truck traffic would occur during construction, and the discharge piping would be below ground. Alternatives GW-4 and GW-5 would not have significant impact on the surface water, since NPDES requirements would be met. All of the groundwater alternatives have increased short-term effectiveness when coupled with a soil alternative, since a soil alternative would either remove a source area or prevent continued leaching of contaminants from the soil to the groundwater.

6. Implementability

All of the Site-wide Alternatives, SW-1 through SW-3, are easily implementable.

For soils and sediments, all of the alternatives are implementable. The caps in alternatives S-4, S-4A, S-4B, and S-5 are implementable, as construction associated with multi-media capping is fairly routine and performed relatively often. Alternatives that call for removal of affected soils (Alternatives S-4A, S-5, and S-6) require excavation of contaminated media, so personal protective equipment, and specialized equipment may be required. Alternatives S-4A, S-4B, S-5, S-6, and S-7 call for dewatering the Quarry 3 ponds, and would likely require additional equipment and design. All of the alternatives are implementable without causing undue risk to

the surrounding community. Stabilization called for in Alternative S-7 may be more difficult to implement since it may be difficult to inject a stabilization agent to the deepest potions of contamination in the quarries.

For groundwater, Alternative GW-3 is easily implementable, as no construction is required, and it is likely that existing monitoring wells could be used to monitor for natural attenuation. Alternatives GW-4 and GW-5 would require construction of a discharge line leading from the Site to the Schuylkill River or Matsunk Creek, which may require obtaining access agreements from both private and government parties. In addition, three extraction wells would need to be installed into the center of the plume in order to implement Alternative GW-5.

7. Cost

Cost estimates for each alternative generally include the calculation of direct and indirect capital costs and the annual operation and maintenance (O&M) costs, both calculated on a present worth basis. The cost information for all of the Alternatives is presented in Table 2. The evaluation was based on the Draft FS cost estimates as modified by EPA in the Addendum to the Draft FS Report. It should be noted that the costs presented in Table 2 differ from those in the Draft Feasibility Study. This is due to additional evaluation and modifications by EPA, including using a multi-layer cap instead of an asphalt cap for the capping alternatives; additional costs of construction associated with back fill and soil cover; differences in offsite disposal of soil versus offsite recycling of soils; and differences in costs associated with excavation of pond sediments.

8. State Acceptance

The Commonwealth of Pennsylvania has reviewed this Proposed Plan and the supporting documents and will be involved in the selection of the remedy chosen in the Record of Decision.

9. Community Acceptance

Community acceptance of the preferred alternative will be evaluated after the public comment period on the Proposed Plan ends, and will be discussed in the "Responsiveness Summary" of the Record of Decision for the Site.

PREFERRED REMEDIAL ALTERNATIVE

Based on the comparison of the nine evaluation criteria for each of the alternatives in this Proposed Plan, EPA's preferred alternative includes the following components: **Alternative SW-3: WAL Pipeline Investigation, Alternative S-5: Quarry 3 Removal/Low-Permeability Capping, and Alternative GW-3: Monitored Natural Attenuation**. The total present worth cost estimated for this alternative is $ 12,702,000. Pursuant to EPA policy, all natural attenuation remedies require a contingent groundwater remedy that meets the nine evaluation criteria. In the event that it becomes evident that natural attenuation of the constituents is not occurring, EPA will implement the contingent groundwater remedy. In this case, EPA's contingent preferred groundwater alternative, which meets the nine evaluation criteria, is Alternative GW-5: Groundwater Recovery, Treatment, and Discharge.

THE ROLE OF COMMUNITY IN THE SELECTION PROCESS

This Proposed Plan is being distributed to solicit public comment on the appropriate cleanup action for the Site. EPA relies on public input to ensure that the remedy selected for each Superfund Site considers the needs and concerns of the local community. EPA is providing a 30-day public comment period beginning on June 16, 2000 and ending on July 17, 2000 to encourage public participation in the selection process. EPA will conduct a public meeting during the comment period to present the Proposed Plan and supporting information, answer questions, and accept both oral and written comments from the public. The public meeting will be held on June 27, 2000 at 7:00 p.m. at the Upper Merion Township Building, 175 W. Valley Forge Rd., King of Prussia, PA 19406. EPA will summarize and respond to comments received at the public meeting and written comments post-marked by July 17, 2000 in the Responsiveness Summary in the Record of Decision, which will document EPA's final remedy for the Site. To obtain additional information relating to this Proposed Plan, please contact one of the following EPA representatives:

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Table 1
Human Health Risks at the Crater Resources Site

Area	Child Resident Hazard Index	Adult Resident Hazard Index	Child/Adult Resident Cancer Risk	Trespasser/Visitor		Construction Worker		Industrial Worker	
				Hazard Index	Cancer Risk	Hazard Index	Cancer Risk	Hazard Index	Cancer Risk
Groundwater Center of Plume	550	260	8E-4	--	--	--	--	69	6E-4
Groundwater Extent of Plume	160	66	8E-4	--	--	--	--	20	5E-4
Quarry 1 Soil	1.6*	--	--	--	--	6	--	--	--
Quarry 2 Soil	--	--	--	--	--	4*	--	--	--
Quarry 3 Pond Sediment	3	--	2E-3	--	2E-4	--	--	--	1E-4
Quarry 3 Soil	23**	4**	8E-3**	--	4E-4**	230	2E-4	2**	1E-3**
Quarry 4 Soil	108*	34*	6E-4*	3*	--	21*	--	31*	3E-4*
Quarry 6 Soil	--	--	--	--	--	30**	4E-3**	--	--
Pipeline Soil	7**	--	4E-3	--	2E-4	--	--	--	5E-4

*At least one statistical test indicates that the chemicals driving this risk may be attributable to those found in area indigenous soils.
**Some, but not all, of the chemicals contributing to this risk may be attributable to those found in area indigenous soils.

Unacceptable Risks Include: Cancer Risk > 1E-4 (1 excess cancer risk per 10,000 people exposed)
Hazard Index > 1

Table 2
Estimated Cost of Alternatives

Alternative	Capital Cost	Annual Operation and Maintenance Cost	Total Present Worth Cost
SW-1: No Action	$ 0	$ 0	$ 0
SW-2: Institutional Controls	$ 145,000	$ 2,000	$ 230,000
SW-3: WAL Pipeline Investigation	—	—	$ 148,000
S-3: Soil Cover	$ 5,295,000	$ 9,900	$ 5,407,000
S-4: Low Permeability Cap	$ 7,353,000	$ 11,900	$ 7,501,000
S-4A: Quarry 3 Sediment Removal, Low Permeability Cap	$ 9,064,000	$ 11,900	$ 9,211,000
S-4B: Quarry 3 Sediment Stabilization, Low Permeability Cap	$ 10,342,000	$ 11,900	$ 10,489,000
S-5: Quarry 3 Removal, Low-Permeability Cap	$ 11,806,000	$ 11,900	$ 11,954,000
S-6: Complete Removal	$ 69,103,000	$ 0	$ 69,103,000
S-7: Stabilization	$ 79,873,000	$ 9,900	$ 104,030,000
GW-3: Monitored Natural Attenuation	$ 50,000	$ 26,600	$ 600,000
GW-4: Perimeter Groundwater Recovery	$ 1,607,000	$ 64,800	$ 3,380,000
GW-5: Groundwater Recovery, Treatment, and Discharge	$ 2,184,000	$ 221,700	$ 7,270,000